

Ethics for Computer Software Programming

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Since their beginning, computers have experienced an incomprehensible growth in their importance to our everyday lives. Software development has become just as intensive and complex and most of us go throughout our day without fully appreciating what this new technology does for us. Most people do not worry about having reliable and safe software that has been thoroughly tested for all possibility of errors, especially that software which controls vital medical instruments and transportation. However, there is not a current regulatory organization that protects people from the effects of poorly or under-tested software. It is merely a software designer's ethical obligation when determining what type of testing is conducted.

An example of poor software testing which resulted in injury and death was the Therac-25 Medical Electron Accelerator. The Therac-25 is a computerized radiation therapy machine designed to treat cancer patients by dosing them with radiation bursts. The software problem was caused by a single programmer who failed to correctly document the software specifications or fully test the software. As a result, lethal doses of radiation were given to several patients. The author of the article stated these development problems are not limited to the medical industry. It stems from a blind-faith belief that any good engineer can build software, regardless of whether he or she is trained in state-of-the-art software-engineering procedures (Leveson).

I feel that an industry wide matrix can be made to determine what type and how much testing is required. I also feel that regulation and adherence for this process should be held by our government. This software testing matrix should be based on different levels of criticality. The most stringent testing categories should be those for medical, transportation, and finance.

In the example of Therac-25, high testing costs which make the medical equipment inaccessible for those who can't afford it should never be the reason to expedite the testing process. That is placing a company's financial gain over safety. You cannot attach a cost value

to someone's life or to make a decision on who gets access to medical equipment based on their monetary worth. When considering ever increasing software development and testing costs, most of the software development would be proprietary. Who better to spend the required resources than those who earn revenue on it? Medical equipment companies concerned about the cost of software testing should not be making medical equipment. When people need to seek medical treatment, the last thing they need to worry about is the medical equipment. I definitely would not allow a Doctor to use equipment on me that involved testing standards that were good enough to use on poor people.

It is important to have a moral compass as a software developer. As a Christian, one needs to look at what Paul the Apostle said in Philippians: "not looking to your own interests but each of you to the interests of the others" (Phil 2:4). As a professional, the Institute of Electrical and Electronics Engineers (IEEE), the world's largest technical professional organization, has outlined in their code of ethics: "To hold paramount the safety, health, and welfare of the public, to strive to comply with ethical design and sustainable development practices, to protect the privacy of others, and to disclose promptly factors that might endanger the public or the environment" (IEEE).

As software development becomes more critical, I can't see why the United States won't mandate a certification requirement for those who will engineer future software. Continually, our nation has become victimized with privacy breaches, on-line banking theft, and identity theft. Secure and safe software designed by qualified and certified developers needs to be an industry requirement. Just as engineers who design aircraft or bridges, software developers need professional requirements mandating required levels of education and certification testing which will ensure that only the most qualified software developers are used to design future software.

Works Cited

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